

REMARKS/ARGUMENTS

Amendments were made to the specification per the Examiner's instructions. No new matter has been added by any of the amendments to the specification. Support for the amendments to the specification may be found on page 9, lines 2-6 and page 19, lines 9-14.

Claims 1-28 are pending in the present application. Claims 1-4, 7-11, 14-18, 21-28 are amended. Support for the claim amendments may be found at least in the claims themselves and in the Applicant's specification on page 7, lines 4-30, page 8, lines 27-20, page 9, lines 1-24, page 12, lines 6-12, and page 13, lines 11-16 and lines 25-26, page 14, lines 15-17 and lines 21-23, page 17, lines 17-30, page 18, lines 1-7, Figure 1, Figure 6, and Figure 7. Reconsideration of the claims is respectfully requested.

I. Interview Summary

Applicants thank Examiner Verdi and Supervisory Examiner Thompson for their courtesy in holding a telephone interview with Applicants' representative on October 10, 2007. The Examiners and the undersigned attorney discussed the rejection under 35 U.S.C § 101 vis-à-vis claims 15-21. The Examiner agreed that the amendment to claim 15 and the amendment to the specification would overcome this rejection. The Examiner agreed that the amendment to the specification would not constitute new matter. The Examiners and the undersigned attorney additionally discussed the rejection under 35 U.S.C. § 101 vis-à-vis 22-28. The Examiner agreed that the amendment to claim 22 would overcome this rejection. The Examiners and the undersigned attorney also discussed the rejection under 35 U.S.C. § 103 vis-à-vis claims 1-28. The Examiner agreed that the amendment to claims 1, 8, 15, and 22 would overcome the rejection of the claims under 35 U.S.C. § 103.

II. Claim Objections

The Examiner objected to claims 1, 2, 8, 9, 15, 16, 22, and 23 because of informalities. Applicants have amended claims 1, 2, 8, 9, 15, 16, 22, and 23 accordingly, thereby overcoming these objections.

III. 35 U.S.C. § 101: Asserted Indefiniteness

The Examiner rejects claims 15-21 under 35 U.S.C. § 101 as directed towards non-statutory subject matter. Applicants amended claim 15. As discussed above, the Examiner agreed that this amendment overcomes this rejection to claims 15-21.

The Examiner rejects claims 22-28 under 35 U.S.C. § 101 as directed towards non-statutory subject matter. Applicants amended claim 22. As discussed above, the Examiner agreed that this amendment overcomes this rejection to claims 22-28.

IV. 35 U.S.C. § 103: Asserted Obviousness

The Examiner rejected claims 1-28 under 35 U.S.C. § 103 as unpatentable over *Gerald Karam, Visualization using Timelines*, TRIO Telecommunications Software Methods Project Real-Time and Distributed Systems Group, Department of Systems and Computer Engineering, Carleton University (hereinafter “Karam”) in view of *Bernadi et al, From UML Sequence Diagrams and Statecharts to analyzable Petri Net models*, (hereinafter “Bernardi”). This rejection is respectfully traversed.

In objecting to claim 1, the Examiner states:

Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over “Visualization using Timelines” by Gerald Karam (hereinafter Karam) in view of “From UML Sequence Diagrams and Statecharts to analyzable Petri Net models” by Bernardi et al. (hereinafter Bernardi).

As to claim 1, Karam teaches the invention substantially as claimed including a method for presenting event associations between events from one or more event flows on a display screen of a computer, comprising:

constructing a sequence diagram representation (Xtg Visualization, Fig. 2), said representation having timelines for said event flows (time axis along horizontal dimension, page 131, left col., lines 7-9) and displaying said representation on said display (Human Interface, Display Panel, page 131, left col., lines 1-7, Fig. 4).

Karam does not explicitly teach directional paths between said timelines for said event associations.

However, Bernardi teaches directional paths between said timelines for said event associations (Sequence Diagram, SD, Fig. 6).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the Xtg Visualization of Karam with the teachings of UML Sequence Diagrams from Bernardi because this feature would have provided mechanism to stochastically evaluate those behaviors of the systems that are consistent with the patterns of interaction described by a Sequence Diagram (page 35, right col, lines 27-29 of Bernardi), which is a Unified Modeling Language Diagram utilized to capture different aspects and views of the system (page 35, right col. Lines 26-31 of Bernardi).

Office Action, dated July 17, 2007, pg. 3-4.

The Examiner bears the burden of establishing a *prima facie* case of obviousness based on prior art when rejecting claims under 35 U.S.C. § 103. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed.

Cir. 1992). The prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981 180 USPQ 580 (CCPA 1974). In determining obviousness, the scope and content of the prior art are determined; differences between the prior art and the claims at issue are... ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or non-obviousness of the subject matter is determined. *Graham v. John Deere Co.*, 383 U.S. 1 (1966). Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. *KSR Int'l. Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007). Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006)). In this case, *Karam* and *Bernardi* do not make the claimed invention obvious.

IV.A. The Proposed Combination Does Not Teach or Suggest All of the Features of Amended Claim 1.

Claim 1, as amended, is as follows:

1. A method for presenting event associations between events from one or more event flows on a display screen of a computer, comprising:
 - constructing a sequence diagram representation, wherein the sequence diagram representation comprises a top node associated with a machine or a process;
 - generating event pairs between the events from the one or more event flows, wherein said sequence diagram representation comprises timelines for said event flows and directional paths between said timelines for said event associations, and wherein said sequence diagram representation comprises a higher level and a lower level, wherein a user drills down from the top node associated with the higher level to the lower level in the sequence diagram representation to view the events and event pairs; and
 - displaying said sequence diagram representation on said display screen.

Independent claims 7 and 10 recite similar subject matter. The proposed combination of *Karam* and *Bernardi*, considered as a whole, does not teach or suggest the claimed features of 1) constructing a sequence diagram representation, wherein the sequence diagram representation comprises a top node associated with a machine or a process 2) generating event pairs between the events from the one or more event flows, and 3) the sequence diagram representation comprises a higher level and lower levels, wherein a user drills down from the top node associated with the higher level to the lower levels in the sequence diagram representation to view the events and event pairs.

IV.A.1. Constructing a sequence diagram representation, wherein the sequence diagram representation comprises a top node associated with a machine or a process

The combination of *Karam* and *Bernardi* does not teach or suggest the claimed feature of constructing a sequence diagram representation, wherein the sequence diagram representation comprises a top node associated with a machine or a process, as in amended claim 1.

In rejecting claim 1 as originally filed, the Examiner cites to the following portion of *Karam*:

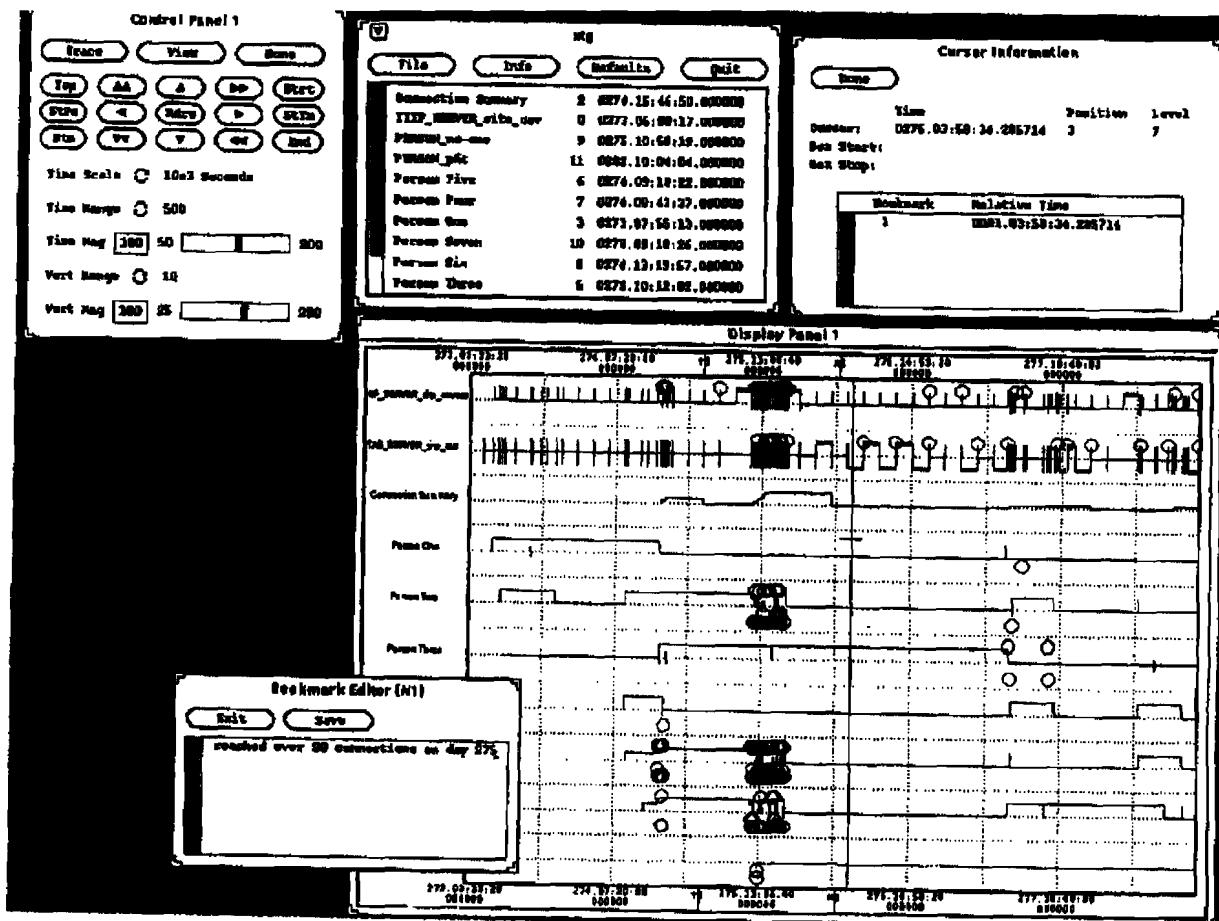


Figure 2: Major Panels of an Xtg Visualization

Karam, Figure 2: Xtg Visualization , pg 129.

The cited figure is a Xtg visualization for displaying client-server interaction timelines. The figure displays one object timeline for each instance of a primitive or abstract object. See *Karam*, pg 129.

Additionally, *Karam* recites:

The visualization (see Figure 2), shows primitive object timelines for people (the clients) and the two types of server (TAS and IIIF, one instance of each). An abstract object, *Connection Summary* is also shown. The people timelines represent 4 state variables: (1) the connection state (the number of people with whom the user is in contact), (2) accessibility level (the degree to which the user is accessible), (3) mirror state (on or off), and (4) the virtual window state (on or off). The level, style, and color are used to show accessibility: +5, solid is fully accessible ("door open" --- connections and glancing are permitted); +3, solid is accessible only to glancing ("door ajar" --- connections require user authorization); 0, solid is unaccessible except by explicit knocking ("door closed" --- connections require user authorization); 0, dashed, completely unaccessible ("door locked"); and 0, solid, and purple is user logged out. Connections are denoted by event annotations and line color. A circle at level +6 indicates the start of a connection --- the color is used to denote the number of participants. A circle at -6 denotes the termination of a connection, and a circle at -3 denotes a failed attempt to connect. Small vertical lines above and below the base-line are used to show mirror and window toggles.

Karam, col 2, lines 10-32, pg. 134.

The cited portion discloses that Figure 2 is displaying object timelines. The object timelines are located on the vertical axis of the figure, and a time scale on the bottom axis of the figure. The figure uses various "levels", circles, styles, and colors to indicate the activity levels of the client-server interactions. These "levels" as described by *Karam* refer to the lines above and below the horizontal dotted lines connected to each object timeline on the leftmost vertical axis of the figure. These lines reveal to the user the level of activity associated with each primitive or abstract object. Additionally, the figure cited above contains various colored symbols and various line styles to indicate client-server activity to the user. However, *Karam* is devoid regarding disclosure of constructing a sequence diagram representation, wherein the sequence diagram comprises a top node associated with a machine or a process.

Indeed, *Karam* does not address the problem of constructing a sequence diagram representation at all. *Karam* is only concerned with providing basic horizontal and vertical timelines with incremental markings to indicate client-server activity. Additionally, no mention is made in *Karam* of a top node.

Instead, the figure cited above discloses a visualization of client-server interactions that are laid out in timelines on a horizontal and vertical axis.

Moreover, *Bernardi* fails to make up for the deficiencies of *Karam*. The Examiner cites to the following in rejecting claim 1:

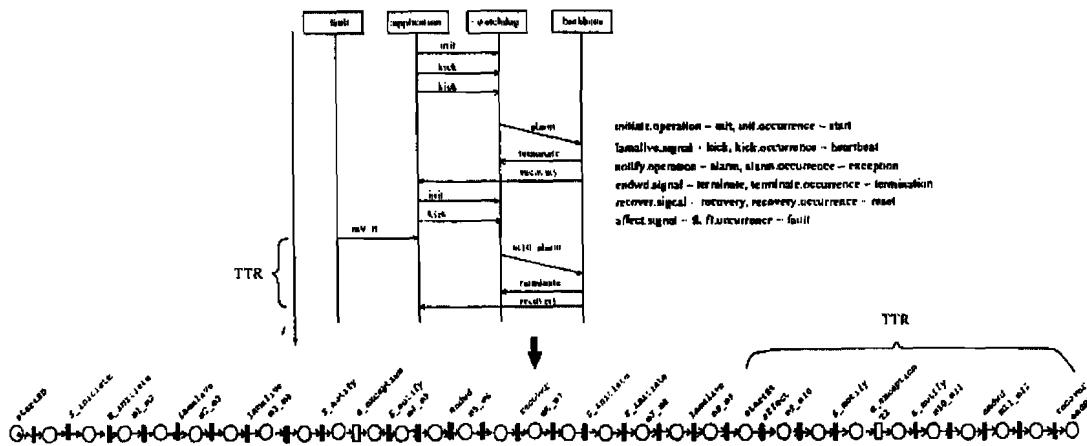


Figure 6: Translation of the SD into LGSPN.

Bernardi, Figure 6, pg 44.

The cited figure displays a sequence diagram model (SD in the title of Figure 6 refers to a sequence diagram). The title of the figure indicates that the sequence diagram messages are translated into LGSPN. However, *Bernardi* does not teach or suggest the feature of constructing a sequence diagram comprising a top node associated with a machine or process. No mention is made at all in *Bernardi* of constructing a sequence diagram whatsoever. *Bernardi* is concerned solely with translating a sequence diagram into LGSPN.

Neither *Bernardi* nor *Karam* teach or suggest the stated features of amended claim 1. Therefore, it would not have been obvious to one of ordinary skill in the art to modify *Karam* in view of *Bernardi*. Thus, the Examiner has failed to state a *prima facie* obviousness rejection against amended claim 1, because the cited art fails to disclose or suggest the feature of “constructing a sequence diagram representation, wherein the sequence diagram representation comprises a top node associated with a machine or process”.

IV.A.II. Generating event pairs between the events from the one or more event flows

The proposed combination of *Karam* in view of *Bernardi* fails to teach or suggest the feature of generating event pairs between the events from the one or more event flows. In rejecting claim 1, the Examiner cites to Figure 2, which is shown above. As discussed above, the figure discloses a Xtg visualization for displaying client-server interaction timelines. However, neither the cited portion nor any

other portion of *Karam* teaches generating event pairs between the events from the one or more event flows, as is recited in amended claim 1.

Amended claim 1 recites a method for constructing a sequence diagram representation and generating event pairs between the events from the one or more event flows in order for a user to be able to view the event pairs. *Karam* does not disclose or suggest generating event pairs between the events from the one or more event flows. Neither does *Karam* make any mention of constructing a sequence diagram. Due to the great differences between the features of amended claim 1 and *Karam*, one of ordinary skill would not be motivated to modify *Karam*.

Moreover, *Bernardi* fails to make up for the deficiencies of *Karam*. *Bernardi* also fails to teach or suggest the feature of generating event pairs between the events from the one or more event flows. In rejecting claim 1, the Examiner cited to Figure 6, which is shown and discussed above. While *Bernardi* discloses using a sequence diagram, *Bernardi* fails to disclose or suggest generating event pairs between the events from the one or more event flows. Indeed, neither the cited portion nor any other portion in *Bernardi* addresses the problem of viewing event associations between events. As such, *Bernardi* also fails to disclose or suggest the feature of generating event pairs between the events from the one or more event flows.

Thus, the proposed combination of *Karam* and *Bernardi* fails to teach or suggest the feature of “generating event pairs between the events from the one or more event flows,” as in amended claim 1. Therefore, the Examiner has failed to state a *prima facie* case of obviousness against amended claim 1.

IV.A.III Sequence diagram representation comprising a higher level and a lower level, wherein a user drills down from the top node associated with the higher level to the lower level in the sequence diagram representation to view the events and the event pairs

The Examiner failed to state a *prima facie* obviousness rejection of claim 1, because the proposed combination of references considered as a whole, does not teach or suggest the feature of a “sequence diagram representation comprising a higher level and a lower level, wherein a user drills down from the top node associated with the higher level to the lower level in the sequence diagram representation to view the events and the event pairs”, as taught by amended claim 1. In rejecting claim 1, the Examiner cited to Figure 2, which is shown above. As discussed, Figure 2 is a Xtg visualization for displaying client-server interaction timelines. However, Figure 2 is void of the currently discussed feature. Instead, Figure 2 discloses a horizontal timeline without either top nodes, or lower levels for the user to drill down to in order to view the events and event pairs. A user would not be able to view event pairs by drilling down through various levels using the embodiment of *Karam*’s invention as displayed in Figure 2. Nor would a user using Figure 2 in *Karam* be able to click on a top node that represents the machine or

process described by the sequence diagram as disclosed by amended claim 1. Therefore, *Karam* fails to teach or suggest all the features of amended claim 1.

Bernardi additionally fails to teach or suggest the feature of a sequence diagram representation comprising a higher level and a lower level, wherein a user drills down from the top node associated with the higher level to the lower level in the sequence diagram representation to view the events and the event pairs. In rejecting claim 1, the Examiner cites to Figure 6 in *Bernardi*, which is shown above. As discussed, Figure 6 displays a sequence diagram and a translation of the messages of the sequence diagram to LGSPN. However, Figure 6 fails to teach or suggest the feature of a higher level and a lower level, wherein a user drills down from the top node associated with the higher level to the lower level in the sequence diagram representation to view the events and the event pairs. Figure 6 is devoid of disclosure of any ability for the user to drill down the sequence diagram to view the events and event pairs. As seen in Figure 6, *Bernardi* is only concerned with translating the messages of the sequence diagram to LGSPN. *Bernardi* is not concerned with constructing a sequence diagram that generates event pairs and events and enabling a user to drill down from a higher level to lower levels to view these event pairs and events. Therefore, the Examiner has failed to state a *prima facie* obviousness rejection against amended claim 1, because the cited art fails to disclose or suggest the feature of a “sequence diagram representation comprising a higher level and a lower level, wherein a user drills down from the top node associated with the higher level to the lower level in the sequence diagram representation to view the events and the event pairs.”

IV. B. Karam Teaches Away from the Presently Claimed Invention

Karam teaches away from the presently claimed invention where *Karam* teaches displaying object timelines without any correlating directional paths between events and event pairs. Such a method of display leads away from constructing a sequence diagram representation as taught by amended claim 1. *Karam* displays timelines that provide incremental measurements for specific activities associated with client-server. The Examiner admits and Applicants agree that *Karam* does not explicitly teach or suggest directional paths between its timelines. Additionally, Applicants assert that *Karam* fails to disclose or suggest any visual associations or correlations exist *whatsoever* between the timelines of Figure 2 in *Karam*. Instead, the user is left to infer the correlations on his or her own. In contradistinction, amended claim 1 claims constructing a sequence diagram representation, where event pairs are generated between events and where the sequence diagram comprises a higher level and a lower level where a user drills down from the higher level to the lower level to view the events and event pairs, thus the user is not left to infer correlations. Thus, *Karam* teaches away from the presently claimed invention in claim 1 where *Karam* only discloses displaying timelines. Thus, one of ordinary skill would not be motivated to modify

Karam to achieve the presently claimed invention, and the Examiner has failed to state a *prima facie* obviousness rejection against claim 1.

IV.C. The Examiner fails to state a sufficient reason to modify the reference

The Examiner bears the burden of establishing a *prima facie* case of obviousness based on prior art when rejecting claims under 35 U.S.C. § 103. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). The scope and content of the prior art are... determined; differences between the prior art and the claims at issue are... ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or non-obviousness of the subject matter is determined. *Graham v. John Deere Co.*, 383 U.S. 1 (1966). Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. *KSR Int'l. Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007). Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006)).

In the case at hand, no *prima facie* obviousness rejection can be stated because the Examiner failed to state a sufficient reason to modify *Karam* in view of *Bernardi* in light of the great differences between the cited art and amended claim 1. Specifically, as shown above, *Karam* in view of *Bernardi* fails to teach or suggest the feature of 1) constructing a sequence diagram representation, wherein the sequence diagram representation comprises a top node associated with a machine or a process 2) generating event pairs between the events from the one or more event flows, and 3) the sequence diagram representation comprises a higher level and a lower level, wherein a user drills down from the top node associated with the higher level to the lower level in the sequence diagram representation to view the events and event pairs.

The Examiner failed to state a sufficient reason to modify *Karam* in view of *Bernardi* because the Examiner's proposed reason for modifying the cited art provides no rational underpinning to support a legal conclusion of obviousness. Regarding a reason to modify *Bernardi*, the Examiner states that:

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Xtg Visualization of *Karam* with the teachings of UML Sequence Diagrams from *Bernardi* because this feature would have provided mechanism to stochastically evaluate those behaviors of the systems that are consistent with the patterns of interaction described by a Sequence Diagram (page 35, right col, lines 27-29 of *Bernardi*), which is a

Unified Modeling Language Diagram utilized to capture different aspects and views of the system (page 35, right col. Lines 26-31 of Bernardi).

Office Action dated July 17, 2007, page 4.

The Examiner offers an advantage as the stated reason for modifying the teachings of *Karam* in view of *Bernardi* in the manner proposed by the Examiner. Specifically, the Examiner proposes modifying the cited art because it would provide a mechanism to stochastically evaluate those behaviors of the system that are consistent with patterns of interaction described by a Sequence Diagram, which is a Unified Modeling Language Diagram utilized to capture different aspects and views of the system. However, the Examiner fails to provide a sufficient reason to modify *Karam* in view of *Bernardi* because the Examiner merely offers a possible advantage for the modification without providing any reason for the modification. In particular, the Examiner does not provide any reason for modifying *Karam* in view of *Bernardi* to provide a mechanism to stochastically evaluate the behaviors of the system where neither *Karam* or *Bernardi* teach or suggest all the features of amended claim 1. Thus, the Examiner's reason for modifying *Karam* in view of *Bernardi* provides an insufficient basis for modifying the teachings of the cited art in the manner necessary to reach each and every feature of amended claim 1, especially in the light of the large differences that exist between *Karam* in view of *Bernardi* and amended claim 1.

For these reasons, the rejection of obviousness vis-à-vis amended claim 1 has been overcome.

V. Independent Claims

Independent claims 8, 15, 22 have features similar to those presented in claim 1. Therefore, claims 8, 15, and 22 are non-obvious at least for the reasons set forth above.

VI. Dependent Claims

If an independent claim is non-obvious under 35 U.S.C. §103, then any claim depending thereon is also non-obvious by virtue of their dependency. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Claims 2-7, 9-14, 16-21, and 23-28 depend from claims 1, 8, 15, and 22. Applicants have already demonstrated claims 1, 8, 15, and 22 are not obvious and are therefore in condition for allowance. Therefore, at least by virtue of their dependence on claims 1, 8, 15, and 22, claims 2-7, 9-14, 16-21, and 23-28 are not obvious over *Karam* in view of *Bernardi*.

In addition, the dependent claims recite additional combinations of features not taught by the cited art. For example, dependent claim 2 recites "wherein the higher level and the lower level comprise at least one process level sequence diagram, at least one thread level sequence diagram, at least one class level sequence diagram, and at least one object level sequence diagram." As discussed above, neither

Karam nor *Bernardi* discloses a sequence diagram comprising a higher level associated with a top node or lower level wherein the user drills down to view event pairs and events. As such, neither *Karam* nor *Bernardi* disclose a higher level and a lower level comprising at least one of a process level, thread level, class level, and object level sequence diagrams.

Additionally, dependent claim 4 recites “the sequence diagram representation may present event associations from multiple logs; and non-associated events are excluded by filtering the non-associated events.” Neither *Karam* nor *Bernardi* teach or suggest the features of a sequence diagram representation presenting event associations from multiple logs. Neither do the references teach or suggest the feature of filtering non-associated events. Therefore, neither *Karam* nor *Bernardi* teach or suggest all the features of dependent claims 2 and 4.

As shown above, *Karam* in view of *Bernardi* fails to teach or suggest all of the features of claims 1-28. Additionally, *Karam* teaches away from the presently claimed invention. Therefore, the proposed combination and modification of the cited references when considered together as a whole does not teach or suggest all of the features of claims 1-28. Therefore, the Examiner has failed to state a *prima facie* obviousness rejection against these claims.

VII. Conclusion

Applicants respectfully submit that the subject application is patentable over the cited references and should now be in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

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